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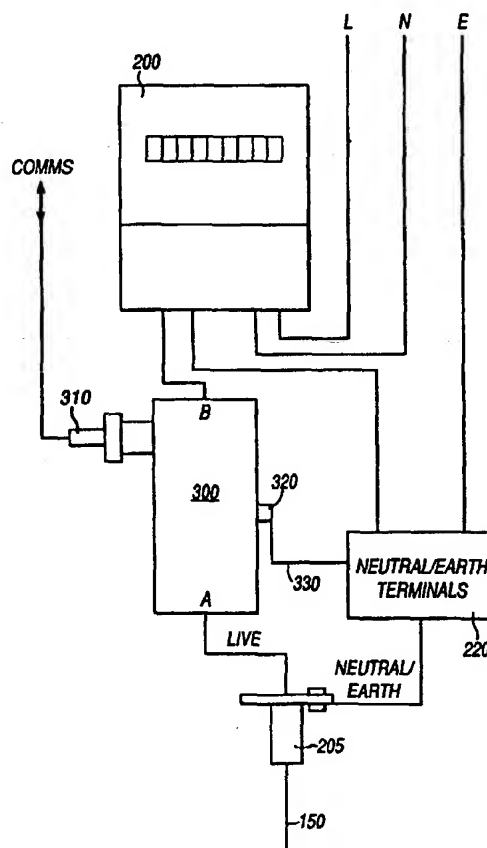
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/GB98/00173		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	
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(74) Agent: RYAN, John, Peter, William; Nortel Patents, London Road, Harlow, Essex CM17 9NA (GB).			
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		(88) Date of publication of the international search report: 11 September 1998 (11.09.98)	

(54) Title: POWER LINE TRANSMISSION

(57) Abstract

A power line communications network carries power and communications signals over power lines. Fitted in the power line is a fuse unit (300) which has means for coupling communications signals to and/or from the power line. The fuse unit may include a high-pass filter. The fuse unit (300) is adapted to mate with an existing fuse socket in the power line to replace an existing fuse, thereby minimising disruption and simplifying installation. The fuse unit can also include means for impeding flow of non-power signals along the line.



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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/00173

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 6 H02J13/00 H04B3/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H02J H04B H01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 124 835 A (CAHILL JR WILLIAM J) 7 November 1978 see column 2, line 43 - line 62; figures 1-3 see column 3, line 32 - line 45 ---	1,2,4
X A	GB 2 062 376 A (SWISH PROD) 20 May 1981 see page 3, right-hand column, line 80 - line 117; figures 7-12 ---	18 1-17
A	WO 94 09572 A (BROWN PAUL A ;NORWEB PLC (GB)) 28 April 1994 cited in the application see abstract; figure --- -/-	1-18

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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 "O" document referring to an oral disclosure, use, exhibition or other means
 "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
 "&" document member of the same patent family

Date of the actual completion of the international search

20 April 1998

Date of mailing of the international search report

14.07.98

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 98/00173

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 349 240 A (FELTEN & GUILLEAUME CARLSWERK) 18 November 1977 see page 4, line 22 - line 40; figure 1 ---	1-18
A	EP 0 119 187 A (HAWLAN HANS) 19 September 1984 see page 26, line 1 - page 27, line 1; figure 4 -----	1-18

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 98/00173

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. claims 1-18: fuse unit incorporating means for coupling communications signals to and/or from the power line
2. claim 19: power line monitoring unit for coupling communications signals to and/or from the power line

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-18

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 98/00173

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4124835 A	07-11-78	NONE	
GB 2062376 A	20-05-81	GB 2060964 A EP 0028882 A	07-05-81 20-05-81
WO 9409572 A	28-04-94	AU 673388 B AU 5373294 A CA 2146648 A EP 0667067 A FI 951844 A GB 2272350 A,B GB 2304013 A,B HK 125897 A HK 125997 A JP 8505272 T NO 951500 A US 5684450 A	07-11-96 09-05-94 28-04-94 16-08-95 18-04-95 11-05-94 05-03-97 19-09-97 19-09-97 04-06-96 20-04-95 04-11-97
FR 2349240 A	18-11-77	DE 2617542 A BE 853836 A CH 612808 A	03-11-77 16-08-77 15-08-79
EP 0119187 A	19-09-84	AT 386704 B DE 3475589 A	10-10-88 12-01-89